

WHAT IS CLAIMED IS:

1. A communication cable comprising:

a transmitting connector;

a receiving connector;

5 an elongated flexible conductor integrated between said transmitting connector and said receiving connector, said elongated conductor including a fiber assembly comprising at least one optical fiber and a wire assembly comprising at least one metallic wire, said metallic wire to conduct electrical power,  
10 said optical fiber to conduct light pulses; and

said transmitting connector including a first light emitting device connected to said optical fiber, said first light emitting device to receive an electrical signal and then convert said electrical signal into a corresponding light signal which is  
15 transmitted through said optical fiber to be reconverted back into an electrical signal by a first light receiving device at said receiving connector.

2. The communication cable as defined in Claim 1 wherein:

20 said transmitting connector includes a first flexible printed circuit board, said receiving connector including a second flexible printed circuit board.

3. The communication cable as defined in Claim 1  
wherein:

said wire assembly comprising a plurality of spaced  
apart wires, said fiber assembly including a plurality of spaced  
5 apart optical fibers.

4. The communication cable as defined in Claim 1  
wherein:

said optical fiber being fixedly mounted within both  
said transmitting connector and said receiving connector whereby  
10 said cable can incur abuse in a harsh environment and not break or  
become inoperative and still be able to operate, said optical  
fiber being fixedly mounted by being mounted alongside a high  
tensile strength elongated member.

5. The communication cable as defined in Claim 1  
15 wherein:

said transmitting connector also including a second  
light receiving device, said receiving connector including a  
second light emitting device, said second light emitting device  
being connected through said fiber assembly to said second light  
20 receiving device.

6. A connector for a communication cable comprising:  
a housing;

a light pulse receiver mounted within said housing, said  
light pulse receiver being connected to a flexible printed circuit  
5 board, said flexible printed circuit board being mounted within  
said housing;

a light source connected to said housing, said light  
source to supply a light pulse to said light pulse receiver; and

an electrical signal output connector connected to said  
10 printed circuit board, said electrical signal output connector  
adapted to receive an electrical signal from said printed circuit  
board and transmit same to an external piece of equipment.

7. The connector as defined in Claim 6 wherein:  
said light source comprises a flexible cable.

15 8. The connector as defined in Claim 7 wherein:  
said cable includes a plurality of separate optical  
fibers and a plurality of separate electrical conducting wires.

9. The connector as defined in Claim 8 wherein:  
said cable being fixedly mounted to said housing so said  
20 light source is not capable of any movement relative to said  
housing which would result in non-transmission of said light pulse  
to said light pulse receiver.

10. The connector as defined in Claim 6 wherein:  
said housing also including a light pulse emitter.

11. A connector for a communication cable comprising:  
a housing;

5 a light pulse emitter mounted within said housing, said  
light pulse emitter being connected to a flexible printed circuit  
board, said flexible printed circuit board being mounted within  
said housing; and

10 a light pulse receiver connected to said housing, said  
light pulse receiver to receive a light pulse from said light  
pulse emitter and transmit same to an output path located  
exteriorly of said housing.

12. The connector as defined in Claim 11 wherein:  
said output path comprising a flexible, elongated  
15 conductor.

13. The connector as defined in Claim 12 wherein:  
said conductor is formed of a plurality of spaced apart  
optical fibers and a plurality of spaced apart electrical  
conducting wires.

14. The connector as defined in Claim 13 wherein:

said optical fibers being fixedly mounted to said housing so said light pulse emitter is not capable of any movement relative to said housing which would result in non-transmission of said light pulse to said output path.

15. A method of communicating between a computer and a machine comprising the steps of:

installing between the computer and the machine a communication cable that has integrated both electrical wiring for power transmission and optical fibers for transmitting of control signals.

16. The method of Claim 15 wherein prior to the installing step there is the additional step of constructing the cable so the optical fibers are fixed in position within end connectors to decrease the possibility of non-operation due to installation in an abusive environment.

17. The method of Claim 16 wherein the constructing steps includes:

installing within said end connectors a flexible printed circuit board.